source side driver circuit **915** and the gate signal side driver circuit **914**. Specifically, the control circuit **913** has the function of distributing the image signal as data corresponding to each pixel in the display device and the function of converting a horizontal synchronizing signal and a vertical synchronizing signal, which are inputted from the external, into start signals of the driver circuits and a timing control signal for alternating a built-in power source circuit.

Also, the control circuit **913** may be mounted using an IC chip by a COG method or integrally formed in the inner portion of the liquid crystal display device.

This embodiment can be combined with any one of Embodiments 1 to 6.

[Embodiment 9]

In this embodiment, an example in which an image pickup device (photo diode) is incorporated in each pixel of an EL display device as the first display device or the second display device, which is described in Embodiments 1 to 8, will be described.

FIG. **13** shows the structure of a pixel **1002** in detail. A region enclosed by dot lines is the pixel **1002**.

The pixel **1002** has a switching TFT **1004**, an EL driving TFT **1005**, and an EL element **1006**. In FIG. **13**, although a capacitor **1007** is provided in the pixel **1002**, the capacitor **1007** may not be provided.

The EL element **1006** is composed of an anode, a cathode, and an EL layer provided between the anode and the cathode. When the cathode is connected with the source region or the drain region of the EL drive TFT **1005**, the anode becomes the counter electrode and the cathode becomes the pixel electrode, and thus light is emitted downward. On the other hand, when the anode is connected with the source region or the drain region of the EL drive TFT **1005**, the anode becomes the pixel electrode and the cathode becomes the counter electrode, and thus light is emitted upward.

The gate electrode of the switching TFT **1004** is connected with a gate signal line G. With respect to the source region and the drain region of the switching TFT **1004**, one region is connected with a source signal line S and the other region is connected with the gate electrode of the EL drive TFT **1005**.

The source region of the EL drive TFT **1005** is connected with a power supply line V and the drain region thereof is connected with the EL element **1006**. The capacitor **1007** is connected with the gate electrode of the EL drive TFT **1005** and the power supply line V.

Further, the pixel **1002** has a reset TFT **1010**, a buffer TFT **1011**, a selection TFT **1012**, and a photo diode **1013**.

The gate electrode of the reset TFT **1010** is connected with a reset gate signal line RG. The source region of the reset TFT **1010** is connected with a sensor power source line VB. The sensor power source line VB is always kept to be a constant potential (standard potential). Also, the drain region of the reset TFT **1010** is connected with the photo diode **1013** and the gate electrode of the buffer TFT **1011**.

Although not shown, the photo diode **1013** has an N-type semiconductor layer, a P-type semiconductor layer, and a photoelectric conversion layer provided between the N-type semiconductor layer and the P-type semiconductor layer. Specifically, the drain region of the reset TFT **1010** is connected with, the P-type semiconductor layer or the N-type semiconductor layer of the photo diode **1013**.

The drain region of the buffer TFT **1011** is connected with the sensor power source line VB and always kept to be a constant standard potential. The source region of the buffer TFT **1011** is connected with the source region or the drain region of the selection TFT **1012**.

The gate electrode of the selection TFT **1012** is connected with a sensor gate signal line SG. With respect to the source region and the drain region of the selection TFT **1012**, one region is connected with the source region of the buffer TFT **1011** as described above and the other region is connected with a sensor output wiring SS. The sensor output wiring SS is connected with a constant current power source **1003** and a constant current always flows into the sensor output wiring SS.

FIG. **14** shows a cross sectional view of this embodiment. Reference numeral **1101** denotes a switching TFT, numeral **1102** denotes an EL driving TFT, numeral **1103** denotes a reset TFT, numeral **1104** denotes a buffer TFT, and numeral **1105** denotes a selection TFT.

Also, reference numeral **1108** denotes a P-type semiconductor layer, numeral **1109** denotes a photoelectric conversion layer, and numeral **1107** denotes an N-type semiconductor layer. A photo diode **1106** is formed of the P-type semiconductor layer **1108**, the photoelectric conversion layer **1109**, and the N-type semiconductor layer **1107**. Reference numeral **1111** denotes a sensor wiring and the sensor wiring **1111** is used to electrically connect the N-type semiconductor layer **1107** with an external power source. The P-type semiconductor layer **1108** of the photo diode **1106** is electrically connected with the drain region of the reset TFT **1103**.

Also, reference numeral **1110** denotes a pixel electrode (anode), numeral **1112** denotes an EL layer, and numeral **1113** denotes a counter electrode (cathode). An EL element **1114** is composed of the pixel electrode (anode) **1110**, the EL layer **1112**, and the counter electrode (cathode) **1113**. Note that reference numeral **1115** indicates a bank and the EL layers **1112** of adjacent pixels are separated by the bank.

Reference numeral **1116** denotes an object to be photographed. Light emitted from the EL element **1114** is reflected by the object **1116** to be photographed and irradiated into the photo diode **1106**. In this embodiment, the object to be photographed is provided at the side of the substrate **1100**, where the TFTs are not formed.

In this embodiment, the switching TFT **1101**, the buffer TFT **1104**, and the selection TFT **1105** are all N-channel TFTs. Also, the EL driving TFT **1102** and the reset TFT **1103** are P-channel TFTs. Note that the present invention is not restricted to this structure. Thus, the switching TFT **1101**, the EL driving TFT **1102**, the buffer TFT **1104**, the selection TFT **1105**, and the reset TFT **1103** may be any one of N-channel TFTs and P-channel TFTs.

Note that, as described in this embodiment, when the source region or the drain region of the EL driving TFT **1102** is electrically connected with the anode **1110** of the EL element **1114**, it is desirable that the EL driving TFT **1102** is a P-channel TFT. On the other hand, when the source region or the drain region of the EL driving TFT **1102** is electrically connected with the cathode of the EL element **1114**, it is desirable that the EL driving TFT **1102** is an N-channel TFT.

Note that, since the photo diode of this embodiment can be simultaneously formed together with other TFTs, the number of processes can be decreased.

This embodiment can be combined with any one of Embodiments 1 to 7.

[Embodiment 10]

In this embodiment, an example in which a memory element (SRAM) is incorporated in each pixel of an EL display device as the first display device or the second